network areas by overlaying the graphs of the network area 1 and network area 2 preliminary network availabilities for day-type weekday, and considering the mathematical minimum of the overlaid graphs to define the global network availability for day-type "weekday."

As a next step, a final local network availability may be defined for each day-type in each network area. The final local network availability for a particular network area and day-type may be defined by taking the preliminary local network availability for that network area and day-type, and subtracting from it the final global network availability for that day-type. This is shown by example in Fig. 6 where the final local network availability for network area 1 and day-type weekday was defined by graphically subtracting the final global network availability graph for day-type weekday from the preliminary local network availability graph for day-type weekday in network area 1.

With the final local and final global network availabilites defined, a next step may to be to perform partitioning of the available bandwidth into several quality of service (QoS) classes. According to one embodiment of the present invention, six QoS classes are used. The first of the six classes is "global/constant" (GC). This class provides a constant bandwidth that is available 24 hours a day, 7 days a week. This class could be used for purposes such as delivering streaming content, service announcements, access keys, or the like to all network areas.

The second of the six classes is "global/time bound" (GT). This class is used for distribution of content to all network areas, and provides blocks of various bandwidths and time durations. Particular GT blocks are offered to service providers who wish for scheduled delivery. For example, a particular GT block might be offered that provides 12 Mbit/s for 12 minutes starting at 6 p.m. on November 12, 2003.

The third of the six classes is "global / dynamic priority". Like GT, GD is used for distribution to all network areas and provides blocks of various bandwidths and time durations.

However, particular GD blocks are not offered to content providers. Because the content provider cannot choose a particular GD block, although these blocks are employed to offer delivery before a specified date, they tend not to be employed to offer delivery at a specific time. Instead, a content provider may be offered transmission before a stated date using a block offering a particular bandwidth. If the content provider accepts, the DDS or an employee thereof decides which of the blocks matching the criteria will be given to the content provider. Thus, unlike GT blocks, the content provider does not choose a particular block; instead the choice is made by for the content provider.

For example, there might be seven GD blocks offering 12 Mbit/s for 12 minutes between 12 October 2002 and 13 October 2002, each of the blocks providing for transmission over the wireless link at a different particular time. A content provider seeking GD blocks might accept an offering of 12 Mbit/s for 12 minutes between 12 October 2002 and 13 October 2002. However the content provider would not know which of the seven blocks he would actually be assigned. Instead this decision would be made by an employee and/or computer of the DDS. For example, a DDS computer could be programmed to make this decision in a way that optimizes the use of available bandwidth. Thus while the content provider would know that his distribution would occur before October 13th, he would not know the actual time of distribution.

The fourth through sixth QoS types are "local/constant" (LC), "local/time-bound" (LT), and "local/dynamic priority" (LD). These QoS types analogous to the GC, GT, and GD types described above but are used for distribution within specific network areas rather than for global distribution. Fig. 7 shows an exemplary partitioning of final network availability into the GC, GT, and GD classes described above.

According to embodiments of the present invention, bandwidth of a certain QoS class that remains unassigned by a certain deadline might be reassigned so as to become

bandwidth of another QoS class. For example, GC bandwidth that remains unassigned might be reassigned to become GT and/or LC bandwidth, GT bandwidth that remains unassigned might be reassigned to become GT and/or LT bandwidth, GD bandwidth which remains unassigned may be reassigned to become LD bandwidth, LC bandwidth which remains unassigned may be reassigned to become LT bandwidth, and LT bandwidth which remains unassigned may be reassigned to come LD bandwidth. The deadlines will generally be expressed in terms of time before transmission over the wireless link of the bandwidth in question. For example, the deadline for the reassignment of GC bandwidth might be 10 days before that bandwidth will be transmitted over the wireless link. As a further example, the deadlines for the reassignment of GT, GD, LC, and LT bandwidth might respectively be five days, two days, five weeks, and 1 day.

Bandwidth Selection by Content Providers

A content provider wishing to distribute content such as files, software, media, or the like using the distribution system of the present invention must first secure bandwidth for the distribution. As was described above, the total transmission bandwidth available in the DDS is split into a number of QoS blocks of varying lengths and bandwidths. According to certain embodiments of the present invention running on one or more computer of the DDS will be a scheduling intelligence module 1217, and a content provider may secure QoS blocks for a particular distribution using content provider software that interfaces with that module.

In one embodiment of the present invention, the interface may be custom software running on a computer used by the content provider. For example, the software could be written in Java and interface with the scheduling intelligence module using a technique such as SOAP (Simple Object Access Protocol), RMI (remote method invocation), or JMS (Java Messaging Service) over a data link between the content provider and the DDS. This link could be, for